

## MATH 208 Spring 2008

**COURSE TITLE:** Mathematics for Elementary School Teachers – Number and Operations

**COURSE CREDIT:** 3 credit hours

**INSTRUCTOR:** Dr. Christine Kraft                      crkraft@bama.ua.edu  
306B Gordon Palmer                      348.2896

**OFFICE HRS.:** Monday, Wednesday, Friday 10:00 – 11:00; other times by appointment

### TEXT:

- Mathematics for Elementary Teachers by Sybilla Beckmann, 2<sup>nd</sup> ed., published by Pearson/Addison-Wesley, the coordinating Activities Manual, and the bundled Integrating Mathematics and Pedagogy (IMAP) CD
- MATH 208 Course Reader
- Other materials supplied by the instructor

### PREREQUISITES:

- Open only to students majoring in elementary education or special education
- Grade of C- or better in Math 100 or placement score of 310 or higher

**COURSE DESCRIPTION:** This course is the first of a three-course sequence designed to develop a deeper understanding of elementary school mathematics needed for teaching. The course topics include whole numbers and integers, fractions, decimals and arithmetic operations and problem solving within these systems. The goal of the course is to develop conceptual understanding (instead of just procedural understanding) of the number systems and operations by focusing on basic concepts and principles, exploring multiple representations and strategies, and illuminating connections among concepts and procedures. The content knowledge needed for teaching will be reinforced by engaging in inquiry-based activities, analyzing children's ways of thinking, focusing on explanation and communication of underlying mathematical principles when solving problems, and using appropriate manipulatives and technology.

### GENERAL LEARNING OUTCOMES FOR 100-200 LEVEL COURSES:

- Students will be able to demonstrate effective written communication skills.
- Students will be able to collaborate and perform effectively in team activities.
- Students will be able to identify key concepts in the arts, sciences, and humanities to provide a broad perspective on human development.

### LEARNING OUTCOMES FOR THIS COURSE:

- Students will be able to understand a large repertoire of models and interpretations of operations of addition, subtraction, multiplication and division and ways they can be applied.
- Students will be able to develop a strong sense of place value in the base-10 number system.
- Students will be able to understand multi-digit calculations, including standard algorithms, "mental math", and non-standard methods commonly created by students.
- Students will be able to develop conceptual understanding of fractions and operations with fractions.
- Students will be able to understand relationships among fractions and ratios and ways they can be applied.
- Students will be able to recognize how conceptual understanding lays the foundation for algebraic reasoning.
- Students will be able to develop the capacity to think conceptually rather than procedurally and the ability to examine and explain underlying patterns and mathematical structure.

**ATTENDANCE POLICY:** Students are expected to attend all class sessions. The main sources for learning are the daily classroom activities and related discussions. The daily activities are a part of the portfolio reflection, which will be graded at the end of the semester. Each student will be held responsible for all information from each class session whether the student was in attendance or not.

**ASSESSMENT:** Grades will be based on the following

- Homework..... 10%
- Reading & Video Reflections ..... 15%
- Exam 1 (Ch. 2 & Ch. 3) .....20%
- Exam 2 (Ch. 4 & Ch. 5) ..... 20%
- Portfolio Reflection.....5%
- Comprehensive Final Exam (Ch. 2, 3, 4, 5, 6, 7)..... 30%

**GRADES:** The grade for the course will be given as follows:

<b>A-</b> : 90% to 91%	<b>A</b> : 92% to 97%	<b>A+</b> : 98% and above
<b>B-</b> : 80% to 81%	<b>B</b> : 82% to 87%	<b>B+</b> : 88% to 89%
<b>C-</b> : 70% to 71%	<b>C</b> : 72% to 77%	<b>C+</b> : 78% to 79%
<b>D</b> : 60% to 69%		<b>F</b> : below 60%

**HOMEWORK JOURNAL:** Homework will be assigned over each section covered in class, as well as any supplemental topics. Homework assignments will include **problem solutions and written reflections**, described below\*, on those solutions and the underlying mathematics. The homework journal should be a three ring binder, no larger than 1 inch wide, to which students may add homework as the semester continues.

- Homework will be collected after completion of each chapter. I will announce when we are finishing the material on each chapter and announce the date that the homework journal will be collected.
- The homework problems should be clearly labeled and in ascending order. (For example, problem 15 in Section 4.3 should be labeled 4.3.15.) If I cannot find a problem, I cannot grade it.
- Some of the homework problems will be graded for accuracy; others will be graded for completeness. You will not know which problems are which.
- The most important thing about the homework is to understand the underlying mathematics. **\*Therefore, every solution should include not just an answer, but a complete description of the thinking you used to generate the answer even if the question only asks to perform a mathematical operation.**
- You are encouraged to discuss homework problems with your classmates. However, **homework write-ups must be in your own words.** You must quote any sources that you use, including fellow students. The following comes from University guidelines: *“Plagiarism is the act of representing the words, data, works, ideas, computer program or output, or anything not generated by the student, as one’s own. Plagiarism may be inadvertent or purposeful; however, plagiarism is not a question of intent. All suspected incidences of plagiarism must be reported by the course instructor. Plagiarism is considered a serious act of academic misconduct and may result in a student receiving an F in the course and suspension from the University. For more information, see <http://faculty senate.ua.edu/handbook/append-c.html>”*
- **Website: [www.bama.ua.edu/~crkraft](http://www.bama.ua.edu/~crkraft):**
  - Homework solutions will be posted on my website after homework journals have been collected. These should be used to study for tests.
  - Announcements and reminders will be posted on my website. It is your responsibility to check these daily.

**READING & VIDEO REFLECTIONS:** Reflections based on course readings and videos will be assigned over the course of the semester. Some readings will come from the **MATH 208 Course Readings**; other sources may include the **web** and **IMAP videos**. A reflection on an article or video will be a well-developed essay based on directed questions requiring you to reflect on the reading/viewing and connections with your class work or other experiences. Reflections should be typewritten in 12 point, Times New Roman font and double spaced. **It is unlikely that you can develop a good reflection in less than two pages.** You will receive further instructions and suggested focus topics for these reflections when they are assigned.

**PORTFOLIO REFLECTION:** You must keep a portfolio of all your work during the semester (classwork, homework, reflections, and exams). The Portfolio Reflection will be a written assignment with directed questions requiring you to reflect on all your work and learning in the class.